

Japan Patent Office (JP)

L.S.# 461

Public Report of Disclosure of Patent

Opening No. of patent: H 11-278485

Date of Opening: Oct. 12, 1999

Int.Cl. Distinguishing mark

F1

B 65 D 19/24

B 65 D 19/24

A

Request for examination: pending

Numbers of claims: 9 OL

Application No. of Patent: No. H 10-77269

Date of application: March 25, 1998

Inventor: Kiyomi Nagano

6-612-19, Hyakumon, Miyadaicho, Minami-Saitama-gun, Saitama, Japan

Inventor: Yutaka Takezawa

510, 2-7-24, Nishikicho, Iwa-shi, Saitama, Japan

Applicant: Danippon Ink Kagaku Kogyo K.K.

35-58 3-chome Sakashita, Itabashi-ku, Tokyo, Japan

Assigned representative: Katsunori Takahashi, patent attorney

DETAILED REPORT

(Name of the invention)

fire proof polyolefin pallet

Outline

(Solution)

A fire proof polyolefin pallet, which is made of material containing polyolefin which is either polyethylene or polypropylene, halogenized epoxy resin, and decabromobiphenylethane or antimony trioxide as fire proof agents.

(Effects)

Good fire resistance can be attained without depositing fireproofing agent on the surface of the pallet or reducing mechanical strength or lowering molding performance.

Sphere of patent request

(Claim 1)

Claim 1 is regarding a fire proof polyolefin pallet which is made of a polyolefin composition containing polyolefin and halogenized epoxy resin.

(Claim 2)

Claim 2 is regarding the fire proof polyolefin pallet in claim 1 where the polyolefin is either polyethylene or polypropylene.

(Claim 3)

Claim 3 is regarding the fire proof polyolefin pallet in claim 1 or 2 where the halogenized epoxy resin is brominated epoxy resin.

(Claim 4)

Claim 4 is regarding the fire proof polyolefin pallet in claim 4 where the average molecular weight of the brominated epoxy resin is 500 to 25,000.

(Claim 5)

Claim 5 is regarding the fire proof polyolefin pallet in claim 3 or 4 where the amount of bromine in the brominated epoxy resin is 45 to 65 wt. %.

(Claim 6)

Claim 6 is regarding the fire proof polyolefin pallet in claims 1, 2, 3, 4, or 5 where the polyolefin composition contains polyolefin, halogenized epoxy resin, and other fire proof agents.

(Claim 7)

Claim 7 is regarding the fire proof polyolefin pallet in claim 6 where the other fireproofing agent is decabromobiphenylethane.

(Claim 8)

Claim 8 is regarding the fire proof polyolefin pallet in claims 1, 2, 3, 4, 5, 6, or 7 where the other fire proof agent is antimony trioxide.

(Claim 9)

Claim 9 is regarding the fire proof polyolefin pallet in claims 1, 2, 3, 4, 5, 6, 7, or 8 which contains talc in the polyolefin.

Detailed explanation of invention

[0001]

(Technical filed of this invention)

This invention is concerning a fire proof polyolefin pallet such as a polyethylene pallet or polypropylene pallet.

[0002]

(Prior art)

In the past, various products are placed on top of polyolefin pallets such as polyethylene pallets or polypropylene pallets, and the polyolefin pallets with the products are stacked in storage. However, in the case of fire, burning polyolefin pallets can cause a lot of damage. In order to make these pallets fire proof, low-molecular weight halogenized compound can be used as conventional fire proofing agents. However, these materials cause a loss in strength.

[0003]

(Problems that this invention tries to solve)

This invention offers a fire proof polyolefin pallet which prevents damage in case of fire and also maintains strength.

[0004]

(Steps for solution)

This invention offers a fire proof polyolefin pallet made of a polyolefin composition containing polyolefin and halogenized epoxy resin.

[0005] This invention is concerning the fire proof polyolefin pallet above where the polyolefin is either polyethylene or polypropylene. Also, this invention is concerning the fire proof polyolefin pallet above where the halogenized epoxy resin is brominated epoxy resin.

[0006] This invention is regarding the fire proof polyolefin pallet above where the average molecular weight of the brominated epoxy resin is 500 to 25,000. Also, this invention is regarding the fire proof polyolefin pallet above where the amount of bromine in the brominated epoxy resin is 45 to 65 wt. %.

[0007] This invention is regarding the fire proof polyolefin pallet above where the polyolefin composition contains polyolefin, halogenized epoxy resin, and other fire proofing agents.

[0008] This invention is regarding the fire proof polyolefin pallet above where the other fire proofing agent is decabromobiphenylethane. Also, this invention is regarding the fire proof polyolefin pallet above where the other fire proofing agent is antimony trioxide.

[0009] This invention is regarding the fire proof polyolefin pallet above which contains talc in the polyolefin composition.

[0010]

(Examples of practice of this invention)

In the following, desirable examples of practice of a fire proof polyolefin pallet according to this invention are going to be explained based on figures.

[0011] Figure 1 is a cross section of one example of practice of a fire proof polyolefin pallet according to this invention. This invention is regarding a fire proof polyolefin pallet made of polyolefin containing polyolefin, halogenized epoxy resin, and if necessary, other fire proofing agents, and talc.

[0012] The polyolefin used in this invention, for example, can be polyethylene or polypropylene for injection molding with 1 to 50 melt flow index.

[0013] The halogenized epoxy resin used in this invention adds fire proofing to the polyolefin. For example, brominated epoxy resin with 500 to 25,000 average molecular weight and 45 to 65 wt. % bromine is desired. Halogenized epoxy resin currently on the market which can be used in this invention includes terminal epoxy type brominated epoxy resin which has epoxy groups on both ends such as Prasaam EP-13, Prasaam EP-16, Prasaam EP-20, Prasaam EP-100, or Prasaam EP-200 manufactured by Danippon Ink Chemical Manufacturing; one end closed type brominated epoxy resin which has an epoxy group on one end while the other end is closed such as Prasaam EPC-15F manufactured by Danippon Ink Chemical Manufacturing. The polyolefin should contain 0.1 to 5 wt. % halogenized epoxy resin.

[0014] Other fire proofing agents which can be used in this invention, for instance, include organic bromine based fire proofing agents such as decabromobiphenyl ethane, decabromobiphenyl ether, decabromobiphenyl oxide, octabromobiphenyl oxide, hexabromocyclododecane, brominated polystyrene; organic chlorine based fire proofing agents such as chlorinated paraffin, chlorinated polyethylene; organic ester phosphate based fire proofing agents such as triphenyl phosphate, tricresyl phosphate, triallyl phosphate, trischloroethyl phosphate, trisdichloropropyl phosphate; inorganic based fire proofing agents such as antimony trioxide, aluminum hydroxide, magnesium hydroxide. The fire proofing agent should make up 5 to 30 wt. % of the polyolefin composition. In this invention, using decabromobiphenyl ethane and antimony trioxide together as a fire proofing agent is especially desired. The polyolefin should contain 5 to 20 wt. % decabromobiphenyl ethane and 1 to 10 wt. % antimony trioxide.

[0015] In this invention, if necessary, talc is used for adding strength to the molded product. Talc can be used as required for 15 to 40 wt. % of the polyolefin composition.

[0016] In this invention, if necessary, it is possible to add pigments such as titanium white, carbon black, phthalocyanine blue, phthalocyanine green, quinacridone; coloring agents made by kneading these pigments in synthetic resin such as master batch; weatherproof agents such as benzotrizol based, benzophenone based, HALS based; static preventing agents such as monoglyceride based, alkylamine based, alkyl sulfonate based; foaming agents such as azizo carbon amide based; antioxidants such as phenol based; or other additives.

[0017] After preparing the polyolefin composition by combining polyolefin, halogenized epoxy resin, and, if necessary, other fire proofing agents and talc, a fire proof polyolefin pallet can be injection molded using this polyolefin composition.

[0018] For the desirable polyolefin compositions of this invention, that is, ones with halogenized epoxy resin and other fire proofing agents, it is possible to attain a good fire proof polyolefin pallet without depositing fire proofing agents on the surface or lowering mechanical strength or molding performance by using only a small amount of fire proofing agent.

[0019]

(Example of practice)

Example of practice 1

80 wt. parts of BC6C (polypropylene manufactured by Nippon Polychem; melt flow index is 2.7), 1 wt. part of Prasaam EP-100 (terminal epoxy type brominated epoxy resin manufactured by Danippon Ink Chemical Manufacturing; average molecular weight is 10,000; amount of bromine is 52.0 %), 10 wt. parts of decabromobiphenyl ethane, 6 wt. parts of antimony trioxide, and 3 wt. parts of Pramaster EX-1557-30 (master batch manufactured by Danippon Ink Chemical Manufacturing) were combined, and a polypropylene composition was prepared.

[0020] Using this polypropylene composition, a four way pallet 110 cm long, 110 cm wide, and 15 cm high as shown in figure 1 was formed by injection molding as shown in figure 1.

[0021] The four way pallet above was fire proof at a V-2 level when evaluated by UL. It had a 21 oxygen index evaluation. Concerning the four way pallet above, when bending strength was measured by JIS Z 0602 "flat pallet bending test", deflection was 14 mm with a 1250 kg load, which was the same as a pallet without fire proofing agent.

[0022] The four way pallet above was not damaged even when it was dropped from a 2 m height, and it had the same degree of impact-resistance as a pallet without fire proofing agent.

[0023]

Example of comparison 1

80 wt. parts of BC6C (polypropylene manufactured by Nippon Polychem; melt flow index is 2.7), 17 wt. parts of antimony trioxide, and 3 wt. parts of Pramaster EX-1557-30 (master batch manufactured by Danippon Ink Chemical Manufacturing) were combined to form a polypropylene composition.

[0024] Using this polypropylene composition a four way pallet 110 cm long, 110 cm wide, and 15 cm high as shown in figure 1 was formed by injection molding as shown in figure 1.

[0025] When the four way pallet above was dropped from 1 m, it was damaged. Its impact strength was remarkably inferior.

Example of practice 2

60 wt. parts of AY564 (polypropylene manufactured by Sumitomo Kagaku; melt flow rate index 15), 3 wt. part of Prasaam EP-100 (terminal epoxy type brominated epoxy resin manufactured by Danippon Ink Chemical Manufacturing; average molecular weight is 10,000; amount of bromine is 52.0 %), 8 wt. parts of decabromobiphenyl ethane, 6 wt. parts of antimony trioxide, 30 wt. parts of talc, and 1 wt. parts of Pramaster EX-1349-30 (master batch manufactured by Danippon Ink Chemical Manufacturing) were combined to form a polypropylene composition.

[0026] Using acquired polypropylene composition, according to injection molding, one-side use four-sides inserting pallet in 110 cm length and 110 cm width and 15 cm height such as one shown in figure 1 was formed.

[0027] The four way pallet above was fire proof at a V-2 level in a UL evaluation and had a 22 oxygen index evaluation. Concerning the four way pallet above, when bending strength was measured by JIS Z 0602 "flat pallet bending test", deflection was 10 mm at 1250 kg load, which was the same as a high-strength pallet with talc without fire proofing agent.

[0028] The four way pallet above also was not damaged even when it was dropped from 1 m, and it had the same degree of impact-resistance as a high-strength pallet with talc without fire proofing agent.

[0029]

(Effects of this invention)

According to this invention, by using halogenized epoxy with polyolefin, good fire proofing can be attained without depositing fire proofing agent on the surface of the pallet, reducing mechanical strength, or lowering molding performance.

(Simple explanation of figures)

Figure 1: It is cross section of one example of practice of a fire proof polyolefin pallet according to this invention.

(Explanation of symbols)

1: pallet

(19) 【発行国】 日本国特許庁 (J P)

(12) 【公報種別】 公開特許公報 (A)

(11) 【公開番号】 特開平 1 1 - 2 7 8 4 8 5

(43) 【公開日】 平成 1 1 年 (1 9 9 9) 1 0 月 1 2 日

(54) 【発明の名称】 難燃性ポリオレフィン製パレット

(51) 【国際特許分類第 6 版】 B65D 19/24

【 F I 】 B65D 19/24 A

【審査請求】 未請求

【請求項の数】 9

【出願形態】 O L

【全頁数】 4

(21) 【出願番号】 特願平 1 0 - 7 7 2 6 9

(22) 【出願日】 平成 1 0 年 (1 9 9 8) 3 月 2 5 日

(71) 【出願人】

【識別番号】 0 0 0 0 0 2 8 8 6

【氏名又は名称】 大日本インキ化学工業株式会社

【住所又は居所】 東京都板橋区坂下 3 丁目 3 5 番 5 8 号

(72) 【発明者】

【氏名】 長野 清巳

【住所又は居所】 埼玉県南埼玉郡宮代町百聞 6 - 6 1 2 - 1 9

(72) 【発明者】

【氏名】 竹沢 豊

【住所又は居所】 埼玉県蕨市錦町 2 - 7 - 2 4 , 5 1 0

(19) [Publication Office] Japanese Patent Office (JP)

(12) [Kind of Document] Japan Unexamined Patent Publication (A)

(11) [Publication Number of Unexamined Application] Japan Unexamined Patent Publication Hei 11 - 278485

(43) [Publication Date of Unexamined Application] 1999 (1999) October 12 day

(54) [Title of Invention] FLAME RESISTANCE POLYOLEFIN PALETTE

(51) [International Patent Classification 6th Edition] B65D 19/24

[FI] B65D 19/24 A

[Request for Examination] Examination not requested

[Number of Claims] 9

[Form of Application] OL

[Number of Pages in Document] 4

(21) [Application Number] Japan Patent Application Hei 10 - 77269

(22) [Application Date] 1998 (1998) March 25 day

(71) [Applicant]

[Applicant Code] 000002886

[Name] DAINIPPON INK & CHEMICALS INC. (DB 69-057-4512)

[Address] Tokyo Itabashi-ku Sakashita 3-35-58

(72) [Inventor]

[Name] Nagano Kiyomi

[Address] Saitama Prefecture Minami Saitama-gun Miyashiro-machi hearing a hundred times 6 - 612 - 19

(72) [Inventor]

[Name] Takezawa Yutaka

[Address] Saitama Prefecture Warabi City Nishiki-cho 2 - 7 - 24 , 510

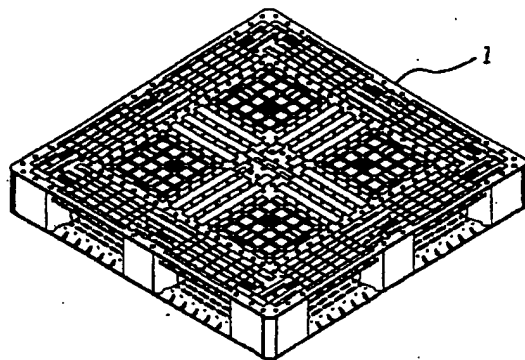
(74) 【代理人】

【弁理士】

(57) 【要約】

【解決手段】 ポリエチレン又はポリプロピレンであるポリオレフィン、ハロゲン化エポキシ樹脂、他の難燃剤としてデカブロモビフェニールエタンや三酸化アンチモンを含有するポリオレフィン組成物によって成形されている難燃性ポリオレフィン製パレット。

【効果】 パレットの表面に難燃剤が析出したり、機械的強度を低下させたり、或いは成形性を低下させたりすること無く、良好な難燃性を付与することができる。



【特許請求の範囲】

【請求項1】 ポリオレフィン及びハロゲン化エポキシ樹脂を含有するポリオレフィン組成物によって成形されていることを特徴とする難燃性ポリオレフィン製パレット。

【請求項2】 ポリオレフィンがポリエチレン又はポリプロピレンであることを特徴とする請求項1記載の難燃性ポリオレフィン製パレット。

【請求項3】 ハロゲン化エポキシ樹脂が臭素化エポキシ樹脂であることを特徴とする請求項1又は請求項2記載の難燃性ポリオレフィン製パレット。

【請求項4】 臭素化エポキシ樹脂の平均分子量が500～25,000であることを特徴とする請求項4記載の難燃性ポリオレフィン製パレット。

【請求項5】 臭素化エポキシ樹脂の臭素含有率が45～65重量%であることを特徴とする請求項3又は請求項4記載の難燃性ポリオレフィン製パレット。

(74) [Attorney(s) Representing All Applicants]

[Patent Attorney]

(57) [Abstract]

[Means of Solution] Flame resistance polyolefin palette which forms by polyolefin composition which contains decabromo biphenyl ethane and the antimony trioxide as polyolefin, halogenated epoxy resin and other flame retardant which are a polyethylene or a polypropylene.

[Effect(s)] Flame retardant can precipitate to surface of palette, mechanical strength can decrease, can grant satisfactory flame resistance or moldability without decreasing.

[Claim(s)]

[Claim 1] Flame resistance polyolefin palette which designates that it forms by polyolefin composition which contains the polyolefin and halogenated epoxy resin as feature.

[Claim 2] Flame resistance polyolefin palette which is stated in Claim 1 which designates that polyolefin is polyethylene or polypropylene as feature.

[Claim 3] Flame resistance polyolefin palette which is stated in Claim 1 or Claim 2 which designates that halogenated epoxy resin is brominated epoxy resin as feature.

[Claim 4] Flame resistance polyolefin palette which is stated in Claim 4 which designates that average molecular weight of brominated epoxy resin is 500 to 25,000 as feature.

[Claim 5] Flame resistance polyolefin palette which is stated in Claim 3 or Claim 4 which designates that bromine content of brominated epoxy resin is 45 to 65 weight% as feature.

【請求項6】 ポリオレフィン組成物がポリオレフィン、ハロゲン化エポキシ樹脂及び他の難燃剤を含有することを特徴とする請求項1、請求項2、請求項3、請求項4又は請求項5記載の難燃性ポリオレフィン製パレット。

【請求項7】 他の難燃剤がデカブロモビフェニルエタンであることを特徴とする請求項6記載の難燃性ポリオレフィン製パレット。

【請求項8】 他の難燃剤が三酸化アンチモンであることを特徴とする請求項1、請求項2、請求項3、請求項4、請求項5、請求項6又は請求項7記載の難燃性ポリオレフィン製パレット。

【請求項9】 ポリオレフィン組成物中にタルクを含有する請求項1、請求項2、請求項3、請求項4、請求項5、請求項6、請求項7又は請求項8記載の難燃性ポリオレフィン製パレット。

【発明の詳細な説明】

【0001】

【発明が属する技術分野】本発明は、難燃性ポリエチレン製パレット又は難燃性ポリプロピレン製パレット等の難燃性ポリオレフィン製パレットに関する。

【0002】

【従来の技術】ポリエチレン製パレット、ポリプロピレン製パレット等のポリオレフィン製パレット上に種々の物品を載せ、倉庫内で物品を載せたポリオレフィン製パレットを多段に積み重ねて保管することが行われているが、倉庫内で火災が発生した場合にポリオレフィン製パレットが燃焼することによって大きな被害を引き起こす恐れがあった。かかるパレットを難燃性にするために通常の難燃剤である低分子量ハロゲン化合物を併用することが考えられるが、強度低下を招くという欠点があった。

【0003】

【発明が解決しようとする課題】本発明は、火災が発生した際に大きな被害を引き起こすことを防止し、強度が保持された難燃性ポリオレフィン製パレットを提供する。

【0004】

【課題を解決するための手段】本発明は、ポリオレフィ

[Claim 6] Flame resistance polyolefin palette which is stated in Claim 1, Claim 2, Claim 3 and the Claim 4 or Claim 5 which designate that polyolefin composition contains polyolefin, halogenated epoxy resin and the other flame retardant as feature.

[Claim 7] Flame resistance polyolefin palette which is stated in Claim 6 which designates that other fire retardant is decabromo biphenyl ethane as feature.

[Claim 8] Flame resistance polyolefin palette which is stated in Claim 1, Claim 2, Claim 3, the Claim 4, Claim 5 and Claim 6 or Claim 7 which designate that other fire retardant is the antimony trioxide as feature.

[Claim 9] Flame resistance polyolefin palette which is stated in Claim 1, Claim 2, Claim 3, the Claim 4, Claim 5, Claim 6 and Claim 7 or Claim 8 which contain talc in the polyolefin composition.

[Description of the Invention]

[0001]

[Invention belongs technological field] This invention regards flame resistance polyethylene palette or flame resistance polypropylene palette or other flame resistance polyolefin palette.

[0002]

[Prior Art] Various goods is placed on polyethylene palette and polypropylene palette or other polyolefin palette, accumulating polyolefin palette which places goods inside warehouse to multistage, keeping is done, but there was a possibility of causing big damage due to fact that polyolefin palette burns when fire occurs inside warehouse. You can think that low molecular weight halogenation compound which is a conventional flame retardant in order to designate this palette as flame resistance is jointly used, but there was a deficiency that causes strength decrease.

[0003]

[Problems to be Solved by the Invention] This invention prevents fact that big damage is caused occasion where fire occurs, offers flame resistance polyolefin palette where strength is kept.

[0004]

[Means to Solve the Problems] This invention offers flame resis

ン及びハロゲン化エポキシ樹脂を含有するポリオレフィン組成物によって成形されていることを特徴とする難燃性ポリオレフィン製パレットを提供する。

【0005】本発明は、ポリオレフィンがポリエチレン又はポリプロピレンであることを特徴とする前記難燃性ポリオレフィン製パレットに関する。本発明は、ハロゲン化エポキシ樹脂が臭素化エポキシ樹脂であることを特徴とする前記難燃性ポリオレフィン製パレットに関する。

【0006】本発明は、臭素化エポキシ樹脂の平均分子量が500～25,000であることを特徴とする前記難燃性ポリオレフィン製パレットに関する。本発明は、臭素化エポキシ樹脂の臭素含有率が45～65重量%であることを特徴とする前記難燃性ポリオレフィン製パレットに関する。

【0007】本発明は、ポリオレフィン組成物がポリオレフィン、ハロゲン化エポキシ樹脂及び他の難燃剤を含有することを特徴とする前記難燃性ポリオレフィン製パレットに関する。

【0008】本発明は、他の難燃剤がデカブロモビフェニルエタンであることを特徴とする前記難燃性ポリオレフィン製パレットに関する。本発明は、他の難燃剤が三酸化アンチモンであることを特徴とする前記難燃性ポリオレフィン製パレットに関する。

【0009】本発明は、ポリオレフィン組成物中にタルクを含有する前記難燃性ポリオレフィン製パレットに関する。

【0010】

【発明の実施の形態】以下、図面に従い、本発明に係わる難燃性ポリオレフィン製パレットの好適な実施の形態について説明する。

【0011】図1は本発明に係わる難燃性ポリオレフィン製パレットの一つの実施の形態を示す斜視図である。本発明は、ポリオレフィン、ハロゲン化エポキシ樹脂及び必要に応じて他の難燃剤、タルクを含有するポリオレフィン組成物によって成形されていることを特徴とする難燃性ポリオレフィン製パレットに関する。

【0012】本発明に於いて使用し得るポリオレフィンは、例えばメルトフローレートが1～50の射出成形用ポリエチレン、メルトフローレートが1～50の射出成形用ポリプロピレンが好ましい。

【0013】本発明に於いて使用し得るハロゲン化エポ

タンス polyolefin palette which designates that it forms by polyolefin composition which contains polyolefin and halogenated epoxy resin as feature.

[0005] This invention regards aforementioned flame resistance polyolefin palette which designates that the polyolefin is polyethylene or polypropylene as feature. this invention regards aforementioned flame resistance polyolefin palette which designates that the halogenated epoxy resin is brominated epoxy resin as feature.

[0006] This invention regards aforementioned flame resistance polyolefin palette which designates that the average molecular weight of brominated epoxy resin is 500 to 25,000 as feature. this invention regards aforementioned flame resistance polyolefin palette which designates that the bromine content of brominated epoxy resin is 45 to 65 weight% as feature.

[0007] This invention regards aforementioned flame resistance polyolefin palette which designates that the polyolefin composition contains polyolefin, halogenated epoxy resin and other flame retardant as feature.

[0008] This invention regards aforementioned flame resistance polyolefin palette which designates that the other fire retardant is decabromo biphenyl ethane as feature. this invention regards aforementioned flame resistance polyolefin palette which designates that the other fire retardant is antimony trioxide as feature.

[0009] This invention regards aforementioned flame resistance polyolefin palette which contains talc in the polyolefin composition.

[0010]

[Embodiment of Invention] You explain below, in accordance with drawing, concerning preferred embodiment of flame resistance polyolefin palette which relates to this invention.

[0011] Figure 1 is oblique view which shows embodiment of one of flame resistance polyolefin palette which relates to this invention. this invention regards flame resistance polyolefin palette which designates that it forms polyolefin, the halogenated epoxy resin and according to need other flame retardant, by polyolefin composition which contains the talc as feature.

[0012] Regarding to this invention, as for polyolefin which it can use, for example melt flow rate the polyethylene for injection molding of 1 to 50, melt flow rate polypropylene for the injection molding of 1 to 50 is desirable.

[0013] Regarding to this invention, halogenated epoxy resin wh

キシ樹脂は、ポリオレフィンに難燃性を付与し得るものであり、例えば平均分子量が500~25,000で臭素含有率が45~65重量%の臭素化エポキシ樹脂が好ましい。本発明に使用し得るハロゲン化エポキシ樹脂の市販品としては、例えば大日本インキ化学工業社製ブラサームEP-13、ブラサームEP-16、ブラサームEP-20、ブラサームEP-100、ブラサームEP-200のように両側末端にエポキシ基を有する末端エポキシ型臭素化エポキシ樹脂、大日本インキ化学工業社製ブラサームEC-14、ブラサームEC-20、ブラサームEC-30、ブラサームEC-200のように両側末端が封鎖された末端封鎖型臭素化エポキシ樹脂、大日本インキ化学工業社製ブラサームEPC-15Fのように片側末端にエポキシ基を有し、片側末端が封鎖された片側末端封鎖型臭素化エポキシ樹脂等を挙げることができる。ハロゲン化エポキシ樹脂は、ポリオレフィン組成物中に0.1~5重量%配合することが好ましい。

【0014】本発明に於いて使用し得る他の難燃剤としては、例えばデカブロモビフェニルエタン、デカブロモビフェニルエーテル、デカブロモビフェニルオキサイド、オクタブロモビフェニルオキサイド、ヘキサブロモシクロドデカン、臭素化ポリスチレンの如き有機臭素系難燃剤、塩素化パラフィン、塩素化ポリエチレンの如き有機塩素系難燃剤、トリフェニルホスフェート、トリクレジルホスフェート、トリアリルホスフェート、トリスクロロエチルホスフェート、トリスジクロロピルホスフェートの如き有機燐酸エステル系難燃剤、三酸化アンチモン、水酸化アルミニウム、水酸化マグネシウムの如き無機系難燃剤等を挙げることができる。難燃剤は、ポリオレフィン組成物中に5~30重量%配合することが好ましい。本発明に於いては、難燃剤としてデカブロモビフェニルエタンと、三酸化アンチモンとを併用することが特に好ましく、ポリオレフィン組成物中にデカブロモビフェニルエタンを5~20重量%及び三酸化アンチモンを1~10重量%配合することが好ましい。

【0015】本発明に於いては、必要に応じて成形物に剛性を付与する為にタルクが使用される。必要に応じて使用されるタルクは、ポリオレフィン組成物中に15~40重量%配合することが好ましい。

【0016】本発明に於いては、必要に応じてポリオレフィン組成物中にチタン白、カーボンブラック、フタロシアニンブルー、フタロシアニングリーン、キナクリドンの如き顔料、これらの顔料を合成樹脂中に混練したマスターバッチ等の着色剤、ベンゾトリゾール系、ベンゾフェノン系、HALS系等の耐候剤、モノグリセライド系、アルキルアミン系、アルキルスルホネート系等の帯電防止剤、アゾジカーボンアミド系等の発泡剤、フェノ

ich it can use is something which can grant flame resistance to polyolefin, for example average molecular weight is 500 to 25,000 and bromine content the brominated epoxy resin of 45 to 65 weight% is desirable. It can use for this invention as commercial product of halogenated epoxy resin which, Like for example Dainippon Ink & Chemicals Inc. (DB 69-057-4512) supplied Pratherm EP-13, Pratherm EP-16, Pratherm EP-20, Pratherm EP-100 and Pratherm EP-200 the end epoxy type brominated epoxy resin which possesses epoxy group in both sides end, like the Dainippon Ink & Chemicals Inc. (DB 69-057-4512) supplied Pratherm EC-14, Pratherm EC-20, Pratherm EC-30 and Pratherm EC-200 both sides end like end-capped chain type brominated epoxy resin and Dainippon Ink & Chemicals Inc. (DB 69-057-4512) supplied Pratherm EPC-15F which capped chain are done it possesses the epoxy group in one side end, one side end can list one side end-capped chain type brominated epoxy resin etc which the capped chain is done. As for halogenated epoxy resin, 0.1 to 5 weight% it is desirable in polyolefin composition to combine.

【0014】 Regarding to this invention, you can list organophosphorus acid ester type flame retardant, antimony trioxide, aluminum hydroxide and like magnesium hydroxide inorganic type flame retardant etc like organic chlorine type flame retardant, tri phenyl phosphate, tricresyl phosphate, the triallyl phosphate, tris chloroethyl phosphate and tris dichloropropyl phosphate like organic bromine type flame retardant, chlorinated paraffin and the chlorinated polyethylene like for example decabromo biphenyl ethane, decabromo biphenyl ether, decabromo biphenyl oxide, octabromo biphenyl oxide, hexabromocyclododecane and the brominated polystyrene as other flame retardant which it can use. As for flame retardant, 5 to 30 weight % it is desirable in polyolefin composition to combine. Regarding to this invention, especially it is desirable to jointly use with the decabromo biphenyl ethane and antimony trioxide as flame retardant decabromo biphenyl ethane 1 to 10 weight % it is desirable in polyolefin composition to combine 5 to 20 weight % and antimony trioxide.

【0015】 Regarding to this invention, talc is used in order to grant stiffness to according to need molded article. according to need as for talc which is used, 15 to 40 weight % it is desirable in the polyolefin composition to combine.

【0016】 Regarding to this invention, master batch or other colorant and benzo triazole system which kneaded the pigment and these pigment like titanium white, carbon black, phthalocyanine blue, the phthalocyanine green and quinacridone in according to need polyolefin composition in synthetic resin, benzophenone type and HALS or other antiweathering agent, monoglyceride system, it is possible to combine alkyl amine type, alkyl sulfonate type or other

ール系等の酸化防止剤、その他の添加剤等を配合してもよい。

【0017】本発明に於いては、ポリオレフィン、ハロゲン化エポキシ樹脂、必要により他の難燃剤及び必要に応じてタルクを配合してポリオレフィン組成物を調製した後に、得られたポリオレフィン組成物を用いて射出成形することにより、難燃性ポリオレフィン製パレットを成形することができる。

【0018】本発明の好ましいポリオレフィン組成物、即ちハロゲン化エポキシ樹脂及び他の難燃剤を組み合わせたものでは、少量の難燃剤を使用するだけで、成形物の表面に難燃剤が析出したり、成形物の機械的強度を低下させたり、或いは成形性を低下させたりすることなく、ポリオレフィン製パレットに良好な難燃性を付与することができる。

【0019】

【実施例】実施例 1

BC6C (日本ポリケム社製ポリプロピレン、メルトフローレート 2.7) 80 重量部、プラサーム EP-100 (大日本インキ化学工業社製末端エポキシ型臭素化エポキシ樹脂、平均分子量 10,000、臭素含有率 52.0%) 1 重量部、デカブロモビフェニルエタン 10 重量部、三酸化アンチモン 6 重量部及びブラマスター EX-1577-30 (大日本インキ化学工業社製マスターバッチ) 3 重量部を配合してポリプロピレン組成物を調製した。

【0020】得られたポリプロピレン組成物を用いて射出成形により、図 1 に示すような長さ 110 cm、幅 110 cm、高さ 15 cm の片面使用四方差しパレット 1 を成形した。

【0021】成形された片面使用四方差しパレット 1 は、UL 評価で V-2 レベル、酸素指数評価で 21 の難燃性を示した。成形された片面使用四方差しパレット 1 は、JIS Z 0602 「平パレット曲げ試験」により耐曲げ強度を測定したところ、1250 kg 荷重時に撓み量が 14 mm で、難燃剤未添加のパレットと同等の耐曲げ強度であった。

【0022】また、成形された片面使用四方差しパレット 1 は、2 m の高さから落下させても破損等の異常はなく、難燃剤未添加のパレットと同等の耐衝撃強度を有していた。

【0023】比較例 1

antistatic agent, the azo di carbon amide type or other blowing agent, phenol type or other antioxidant and other additive etc.

[0017] Regarding to this invention, combining other flame retardant and according to need talc the polyolefin and halogenated epoxy resin, in accordance with necessary, after manufacturing the polyolefin composition, flame resistance polyolefin palette it can form by injection molding doing making use of polyolefin composition which it acquires.

[0018] With combination polyolefin composition namely halogenated epoxy resin and other flame retardant where this invention is desirable, just uses flame retardant of trace, the flame retardant can precipitate to surface of molded article, mechanical strength of the molded article can decrease, can grant satisfactory flame resistance to polyolefin palette or the moldability without decreasing.

[0019]

[Working Example(s)] Working Example 1

BC6C (Japan Polychem Corporation supplied polypropylene and melt flow rate 2.7) 80 parts by weight, Pratherm EP-100 (Dainippon Ink & Chemicals Inc. (DB 69-057-4512) supplied end epoxy type brominated epoxy resin, average molecular weight 10,000 and bromine content 52.0%) 1 part by weight, combining decabromo biphenyl ethane 10 parts by weight, antimony trioxide 6 parts by weight and プラ master EX-1577-30 (Dainippon Ink & Chemicals Inc. (DB 69-057-4512) supplied master batch) 3 parts by weight, it manufactured polypropylene composition.

[0020] One surface use square pouring palette 1 of length 110 cm, width 110 cm and kind of height 15 cm which are shown in Figure 1 with injection molding making use of the polypropylene composition which it acquires, it formed.

[0021] One surface use square pouring palette 1 which formed, with UL appraisal showed flame resistance of 21 with V-2 level and oxygen exponent appraisal. one surface use square pouring palette 1 which formed when resistance flexural strength was measured due to JIS Z 0602 "Flat palette bending test", bending amount being the 14 mm at time of 1250 kg load, was resistance flexural strength which is equal to palette of flame retardant no addition.

[0022] In addition, as for one surface use square pouring palette 1 which formed, falling from height of 2m, there is not a breakage or other fault, it had possessed impact resistance which is equal to palette of flame retardant no addition.

[0023] Comparative Example 1

BC6C (日本ポリケム社製ポリプロピレン、メルトフローレート2.7) 80重量部、三酸化アンチモン17重量部及びプラマスターEX-1577-30 (大日本インキ化学工業社製マスターバッチ) 3重量部を配合してポリプロピレン組成物を調製した。

【0024】得られたポリプロピレン組成物を用いて射出成形により、図1に示すような長さ110cm、幅110cm、高さ15cmの片面使用四方差しパレットを成形した。

【0025】成形された片面使用四方差しパレットは、1mの高さから落下させると、破損し、耐衝撃強度が著しく劣った。

実施例2

AY564 (住友化学社製ポリプロピレン、メルトフローレート15) 60重量部、プラサームEP-100 (大日本インキ化学工業社製末端エポキシ型臭素化エポキシ樹脂、平均分子量10,000、臭素含有率52.0%) 3重量部、デカブロモビフェニールエタン8重量部、三酸化アンチモン6重量部、タルク30重量部及びプラマスターED-1349-30 (大日本インキ化学工業社製マスターバッチ) 1重量部を配合してポリプロピレン組成物を調製した。

【0026】得られたポリプロピレン組成物を用いて射出成形により、図1に示すような長さ110cm、幅110cm、高さ15cmの片面使用四方差しパレット1を成形した。

【0027】成形された片面使用四方差しパレット1は、UL評価でV-2レベル、酸素指数評価で22の難燃性を示した。成形された片面使用四方差しパレット1は、JIS Z 0602 「平パレット曲げ試験」により耐曲げ強度を測定したところ、1250kg荷重時に撓み量が10mmで、難燃剤未添加のタルクを添加した高剛性パレットと同等の耐曲げ強度であった。

【0028】また、成形された片面使用四方差しパレット1は、1mの高さから落下させても破損等の異常はなく、難燃剤未添加のタルクを添加した高剛性パレットと同等の耐衝撃強度を有していた。

【0029】

【発明の効果】本発明によれば、ポリオレフィンにハロ

BC6C (Japan Polychem Corporation supplied polypropylene and melt flow rate 2.7) 80 parts by weight, combining antimony trioxide 17 parts by weight and プラ master EX - 1577 - 30 (Dainippon Ink & Chemicals Inc. (DB 69-057-4512) supplied master batch) 3 parts by weight, it manufactured polypropylene composition.

[0024] One surface use square pouring palette of length 110 cm, width 110 cm and kind of height 15 cm which are shown in Figure 1 with injection molding making use of the polypropylene composition which it acquires, it formed.

[0025] When it falls from height of 1m, breakage it did one surface use square pouring palette which formed, impact resistance was inferior considerably.

Working Example 2

AY564 (Sumitomo Chemical Co. Ltd. (DB 69-053-5307) supplied polypropylene and melt flow rate 15) 60 parts by weight, Pratherm EP-100 (Dainippon Ink & Chemicals Inc. (DB 69-057-4512) supplied end epoxy type brominated epoxy resin, average molecular weight 10,000 and bromine content 52.0%) 3 parts by weight, combining decabromo biphenyl ethane 8 parts by weight, the antimony trioxide 6 parts by weight, talc 30 parts by weight and プラ master ED - 1349 - 30 (Dainippon Ink & Chemicals Inc. (DB 69-057-4512) supplied master batch) 1 part by weight, it manufactured polypropylene composition.

[0026] One surface use square pouring palette 1 of length 110 cm, width 110 cm and kind of height 15 cm which are shown in Figure 1 with injection molding making use of the polypropylene composition which it acquires, it formed.

[0027] One surface use square pouring palette 1 which formed, with UL appraisal showed flame resistance of 22 with V-2 level and oxygen exponent appraisal. one surface use square pouring palette 1 which formed when resistance flexural strength was measured due to JIS Z 0602 "Flat palette bending test", bending amount being the 10 mm at time of 1250 kg load, was resistance flexural strength which is equal to high stiffness palette which adds talc of flame retardant no addition.

[0028] In addition, as for one surface use square pouring palette 1 which formed, falling from height of 1m, there is not a breakage or other fault, it had possessed impact resistance which is equal to high stiffness palette which adds talc of flame retardant no addition.

[0029]

[Effects of the Invention] Flame retardant can precipitate to su